

INDIANA YARD WASTE SOLUTIONS

Yard Waste Management Options: An Introduction

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Yard waste debris such as grass clippings, leaves and tree prunings are estimated to make up 18% by weight and 10% by volume of the municipal waste stream. During the growing season, yard waste can amount to 50% or more of the residential solid waste stream in some Indiana communities.

In 1989, EPA published Yard Waste Composting - A Study of Eight Programs, providing case study information about yard waste composting alternatives for communities faced with growing solid waste management problems. The yard waste streams of the eight communities in the study showed widely varying characteristics. Leaves ranged from 20% to 50%, grass clippings accounted for 5% to 64% and brush ranged from 19% to 45% of the yard waste stream. The wide variation in the characteristics of the residential yard waste stream emphasizes the need for communities to study the composition of their own yard waste characteristics before planning any programs to manage this portion of the waste stream.

Waste management officials at all levels of government have stressed source reduction reuse and recycling as sound ways to reduce our reliance on final disposal. Currently, yard waste not only takes up valuable landfill space, but can contribute to methane gas production, acidic leachate production and settling problems as well. Yard waste also reduces the efficiency of incinerators because of the waste's high moisture content. With disposal tipping fees steadily increasing, yard waste source reduction, reuse and recycling provide local government and private haulers a unique opportunity to significantly reduce the amount of solid waste going to final disposal. Keeping yard waste out of the trash truck saves money and protects the environment.

The landscape management practices of residents will have to be changed as yard waste management practices are incorporated within the overall solid waste management system of a community. However, with careful planning and an aggressive public education program, a successful yard waste management strategy can be designed and implemented which will allow homeowners to participate through a program that suits their lifestyle.

As Indiana solid waste management districts, cities, and towns develop strategies to manage yard debris, a comprehensive and efficient yard waste management program is being recommended as a way to achieve solid waste diversion goals and comply with the Indiana's yard waste restrictions (I.C. 13-20-9).

Source reduction

Source reduction is an important component of a comprehensive yard waste management strategy. Source reduction encourages those activities which beneficially utilize yard wastes at the site of generation and keeps it out of the waste stream. Yard waste source reduction programs depend upon strong public education and can be very effective.

Some examples of source reduction program that may be encouraged by local government, solid waste districts and other waste handlers include:

Don't Bag It or Leave It Lay. These are programs which encourage residents or lawn care crews to discontinue mowing practices which result in bagging grass clippings and other yard wastes for disposal. People generally bag grass clippings because they believe that it will result in more attractive and healthier lawns. In the past few years, lawn care experts have recommended simple changes in mowing and fertilizing practices. These changes result in an attractive and healthy lawn and also result in saved time and money for residents and lawn owners and decreased disposal needs. An aggressive public education program to spread this message can change residential and community landscape management practices.

Programs Which Encourage Use of Yard Waste for Landscape Enhancement. Through public education, residential and community groundskeepers can be given alternatives such as use of grass clippings or chopped leaves as a mulch for weed control or use of broken or chipped wood wastes for pathways. They can also be taught that some plant materials should not be used for mulch, as these plant materials are host or winter homes for insects and diseases that are economically detrimental to good crop production. For example, all dead apple wood should be removed from an apple orchard and destroyed to prevent the overwintering of apple diseases.

Backyard Composting. Backyard composting offers an excellent opportunity to reduce the amount of yard waste set out for collection. Backyard composting can be supported through public education and/or subsidies. A 1989 pilot study by the city of Kokomo indicated that up to 10% of the population was initially interested in backyard composting. According to an article by John Roulac in *Composting News*, a 20% participation rate in backyard composting has been achieved in Toronto, Canada and other Ontario communities have surpassed the 30-40% participation levels. Similar studies by Seattle, Washington showed that ultimately up to 50% of the residents might be encouraged to home compost at least part of their yard wastes.

A small composter located at the home can accept and decompose a significant part of the yard waste and possible other non-meat food wastes from the home. If the homeowner has been properly trained in the operation and maintenance of the composter, there will be no aesthetic problems from the unit. Because backyard composting requires time and space to process and turn, not all residents will want or be able to participate. Although piles can be left to compost naturally, poor maintenance can result in unpleasant odors. Finally, some residents may not have a need for the finished compost material and others may not want to take the time to build and properly maintain a compost pile.

Incorporation of Yard Waste Into Soil. Yard wastes may be incorporated directly into garden or other ground and allowed to decompose slowly. The methods and benefits of this practice may be explained to residents and community groundskeepers through public education.

The benefits of source reduction for yard wastes can accrue to both the resident and party responsible for collection and disposal of the yard waste. For the resident or community groundskeeper, the benefits include reduced time required to bag waste, costs of the bags, and significant improvement in health and appearance of the soil and the landscape. The resident may also pay less for waste disposal, especially if

the community has volume- or weight-based disposal fees. The benefits to the collector of the solid waste include increased economies of the collection operation and a reduction in the amount of materials that must go to final disposal sites.

As with any program, there are challenges that must be addressed to implement the yard waste source reduction program. Time and money must be committed to public education because most source reduction requires a change in landscape management habits by the resident or community groundskeeper. Public education must clearly explain what new habits are needed and why these changes are important to the individual and the community. In addition, there may be expenses that will be incurred by the individual and/or community for items such as mulching mowers, chipping machines and backyard composting units.

Source reduction is an important component of a yard waste management program but it is important to remember that not all residents or groundskeepers will want to participate or be able to utilize all of their yard wastes. Other options must be provided to these persons.

Chipping

Chipping refers to a breaking up of large and medium yard debris, by a heavy-duty mechanical chipper. Chipping or shredding may significantly reduce the volume of loose tree limbs and brush as well as other woody wastes. The resulting chipped wood may be put to several beneficial uses. Wood chips are used directly as mulch, garden, playground or other landscape cover. Wood chips may also be used as ingredients in composting operations, bulking agents for sludge management or as a fuel source.

A variety of wood waste processing equipment is available for large and small operations. Wood waste is currently processed on a regular basis by tree services, utility companies, local governments, sawmills and other scrap wood processors. In addition to the normal wood waste generated by residents, there are some circumstances that result in large volumes of wood waste generated during a short time interval. These include Christmas trees and storms. Communities must be prepared to handle this wood waste in addition to normal wood waste.

Wood waste programs allow beneficial use of chipped materials while reducing the amount of waste material that must be landfilled. Costs involved in a wood waste processing program include the capital cost of chipping equipment and other associated equipment such as front end loaders, trucks, screens and conveyors. Personnel costs must also be considered. Wood wastes may be either collected from the site of generation or accepted at a drop off site. A program for the use of the chipped material must also be included.

Composting

Composting is the aerobic, biological decomposition of organic materials under controlled conditions. The composting process can reduce material volume by as much as 70-percent. The material that remains after composting is called compost and contains a large amount of humus. Composting operations can range from small backyard source reduction efforts to large community or commercial ventures.

Composting can be beneficial for numerous reasons. The composting process converts organic wastes into beneficial products, while at the same time destroys pathogens and weed seeds. Compost, when added to the soil, improves soil quality because it increases the soil's water holding capacity, decreases compaction potential, increases permeability and reduces erosion potential. Compost also provides nutrients in an organic form, which are made available to the plants throughout the growing season.

Neighborhood composting is similar to home composting as a landfill diversion technique. However, in this case, the operation of the composter is a cooperative effort, shared by several families in a neighborhood, and would need to be registered with IDEM. The residents haul their yard wastes to a central neighborhood location that may contain two or more composter units. The operation of the units as well as the end product is divided among the participants. As with individual home composting, local governments must provide public education to encourage this alternative.

Centralized larger-scale composting will also be required to complete a comprehensive yard waste management system. Centralized composting will require investment of capital and operational funds by the community, but will reduce landfill costs and produce a valuable end product. Capital costs would include the purchase of collection vehicles, land for the compost site, and composting equipment. Operational costs would include wages, fuel and maintenance of equipment, and compost site operation.

In centralized composting, there are basically two methods of obtaining the yard wastes: separate collection and citizen drop-off. A community may use one or both methods. Using separate collection, the community must be dedicated to meeting the needs of the residents. Collection of the yard wastes must be made on a regular basis, because no one wants an odorous pile of grass or leaves or a large pile of brush remaining at their residence for more than a few days. The composting site will also be confronted with variable amounts of yard wastes that will be delivered. This may create problems of scheduling personnel and equipment.

A drop-off center may be located at the compost site or at several convenient sites throughout the service area. A drop-off center will reduce collection and transportation costs, but may also significantly reduce participation as well. A drop-off site, in conjunction with separate collection sites, can provide valuable benefits to the yard waste composting operation. Residents who may miss a separate collection can deliver their yard wastes to the drop-off site. The drop-off site may also be used as a product distribution site.

Whichever collection method is used, large-scale programs can divert a substantial amount of organic materials from final disposal facilities. The end product can be marketed to residents and other consumers as a soil amendment. Large scale composting does require an appropriate composting site and

development of collection, operational, and end-product marketing strategies. Equipment and labor costs must also be included.

Some large-scale composting programs use yard and vegetative materials only as the raw materials. Other operations may include additional ingredients, such as animal waste, food waste, paper, sewage sludge and municipal solid waste. The information in this manual focuses on the composting of yard wastes only.

Land Application

An alternative method for the beneficial use of yard waste is through the direct incorporation of raw, uncomposted leaves, grass, and other non-woody landscape wastes to soil. The raw yard wastes decompose slowly over a period of time and become incorporated back into the soil. Land application of yard wastes may be used as an alternative to or in addition to composting operations. Land application is most suitable for communities with farmland nearby.

Yard waste land application programs must be managed so as to prevent any aesthetic or environmental problems from occurring as a result of the application of the organic materials. Management techniques must address runoff, leaching and odors. Land must be located, evaluated and included in the program. If land is not available at the time that the yard wastes are generated, adequate controlled storage of the yard wastes must be provided.

Land application is an option only if the material is incorporated into the soil long before a crop is planted. The material being land applied needs to be a uniform product and free of all contaminants such as yard waste bags, stones, brush, or other debris. In addition, calculations must be made to determine how much material is appropriate and practical to apply. These calculations would depend in part upon the anticipated rate of decomposition for the yard waste material, soil analysis, previous material applications and the requirements of crops that may be grown in the future.

Land application of yard wastes does not require labor and equipment expense like composting, once the material is applied to the land. However, a comparison of the two yard waste management methods must include the location of land application sites, additional hauling to remote sites, costs for applying and incorporating materials, physical damage to country roads, costs for temporary storage and any site monitoring and reporting which may be required.

Land application returns valuable organic matter to the soil and keeps it out of disposal facilities. Because the material is incorporated into the soil, marketing of an end product is avoided. However, because decomposition takes place in an uncontrolled manner, soil characteristics such as temperature, moisture, oxygen levels and carbon/nitrogen ratios, can fluctuate. This may adversely affect plant growth, especially if the plants are planted in the soil in which the yard waste has only partially decomposed.

While incorporation of yard wastes into the soil has occurred for years on an informal basis, the management procedures for large-scale programs have not been developed. Use of this yard waste management method should be used cautiously and conservatively until management procedures are fully

developed. The local Soil Conservation Service, the Soil and Water Conservation District and the County Extension agent are excellent sources of technical information relating to land application.

Combustion

Another method to manage yard debris used in the past is the burning of these materials in an outdoor setting. In most areas of Indiana, burning of yard wastes as a yard waste management strategy will not be an option because of local burning bans. These bans were enacted because of air pollution and fire concerns.

If a burning ban is not mandated at the local level there are still state rules that must be complied with. Uncontrolled burning yard debris can result in the emission of particulates, carbon monoxide, and nitrogen oxides, which are regulated pollutants. Especially if the yard debris is wet and compacted, the burning process is incomplete. As with any burning, in addition to air emissions, ash remains to be managed. Wood ash can be beneficial to the soil, however, they must be properly applied.

In areas where complete local burning bans are not in place, the burning of the yard waste must be done in containers that meet specific criteria. The containers shall be noncombustible and sufficiently vented to induce adequate primary combustion air with enclosed sides, a bottom, and a mesh covering with openings no larger than one-fourth inch (1/4") square. Burning on the ground or in a 55-gallon drum type of container is illegal. All fires must be closely monitored and must be extinguished if they are a nuisance. Fires are also limited to daylight hours. Local fire and health departments usually enforce open burning regulations.

Because of the air pollution and fire concerns resulting in the complete bans on burning of yard debris in most communities and the benefits of returning the organic matter to the soil by source reduction, reuse or composting, combustion will not be a yard waste management strategy to consider.

Some communities may have an incinerator or waste-to-energy facility as part of their solid waste management program. Although yard waste disposal in incineration units is not included in IC 13-20-9 landfill restrictions, this method of management is poorly suited to leaves and grass. As stated in the 1989 U.S. EPA publication, Yard Waste Composting - A Study of Eight Programs "the high moisture content of this ripe of waste inhibits complete combustion and results in the availability of little net usable energy for energy generation. Burning of these materials contributes to carbon dioxide and nitrogen oxide emissions. Also, the seasonal nature of yard wastes generation can cause incinerators to be over-sized and operate inefficiently".

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